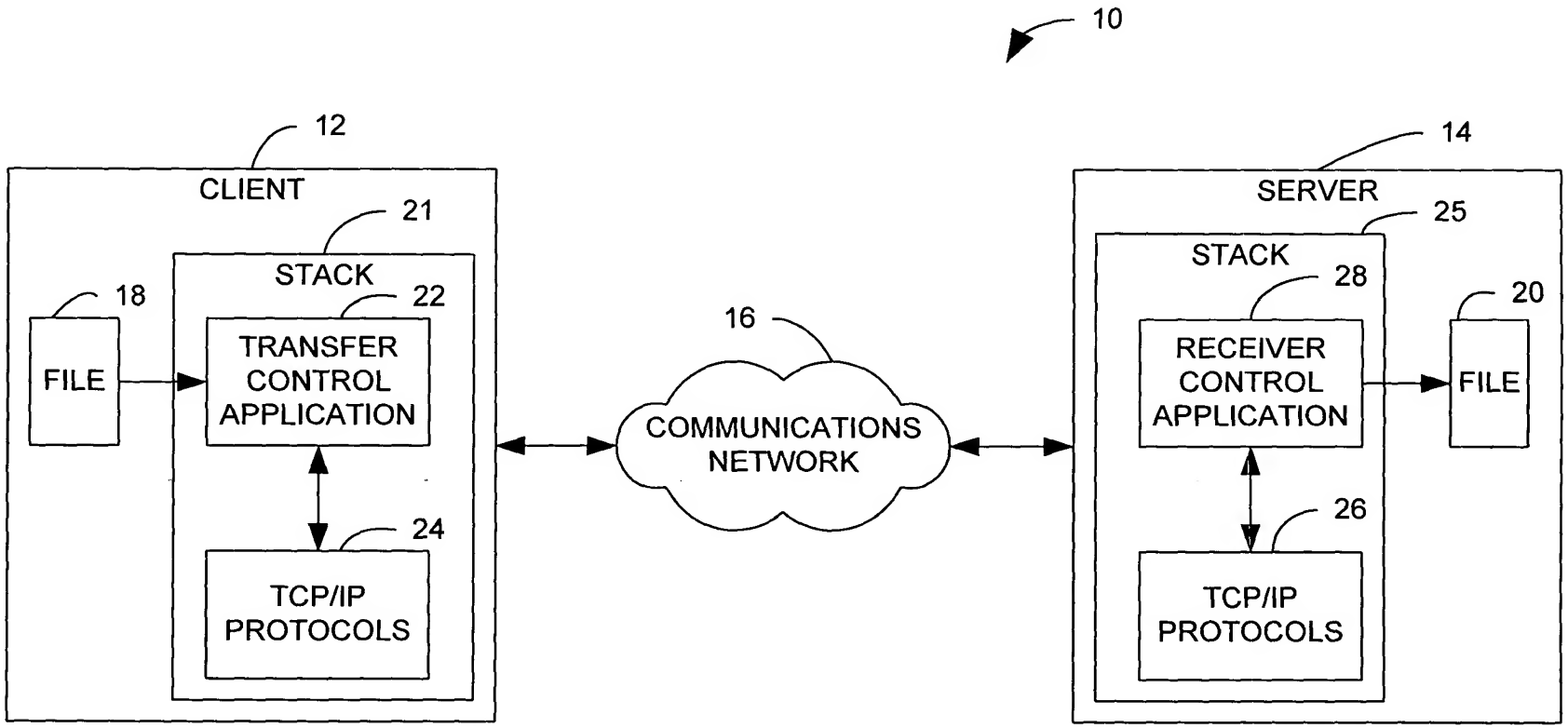
10
12
CLIENT
21
STACK
18
22
FILE
TRANSFER CONTROL APPLICATION
24
TCP/IP PROTOCOLS
16
COMMUNICATIONS NETWORK
14
SERVER
25
STACK
28
20
RECEIVER CONTROL APPLICATION
FILE
26
TCP/IP PROTOCOLS

FIG. 1

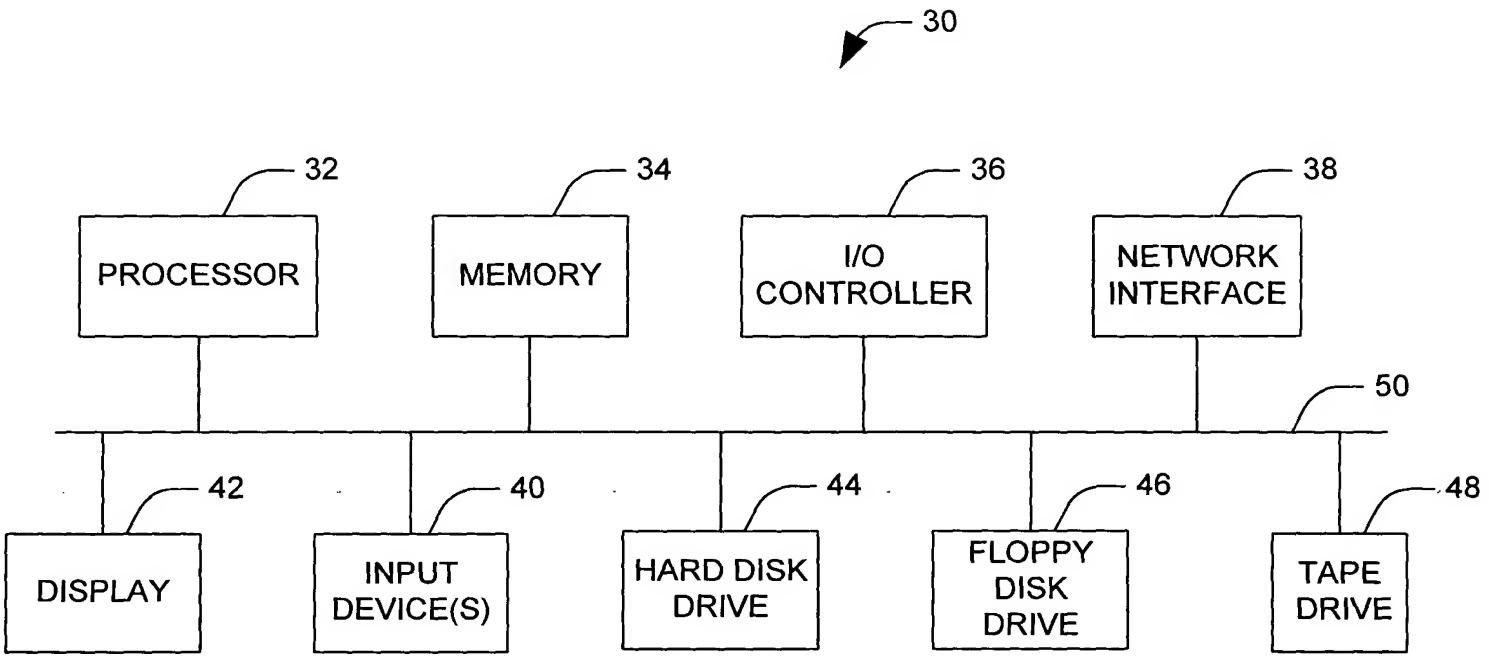
30
32
PROCESSOR
34
MEMORY
36
I/O CONTROLLER
38
NETWORK INTERFACE
50
42
DISPLAY
40
INPUT DEVICE(S)
44
HARD DISK DRIVE
46
FLOPPY DISK DRIVE
48
TAPE DRIVE

FIG. 2

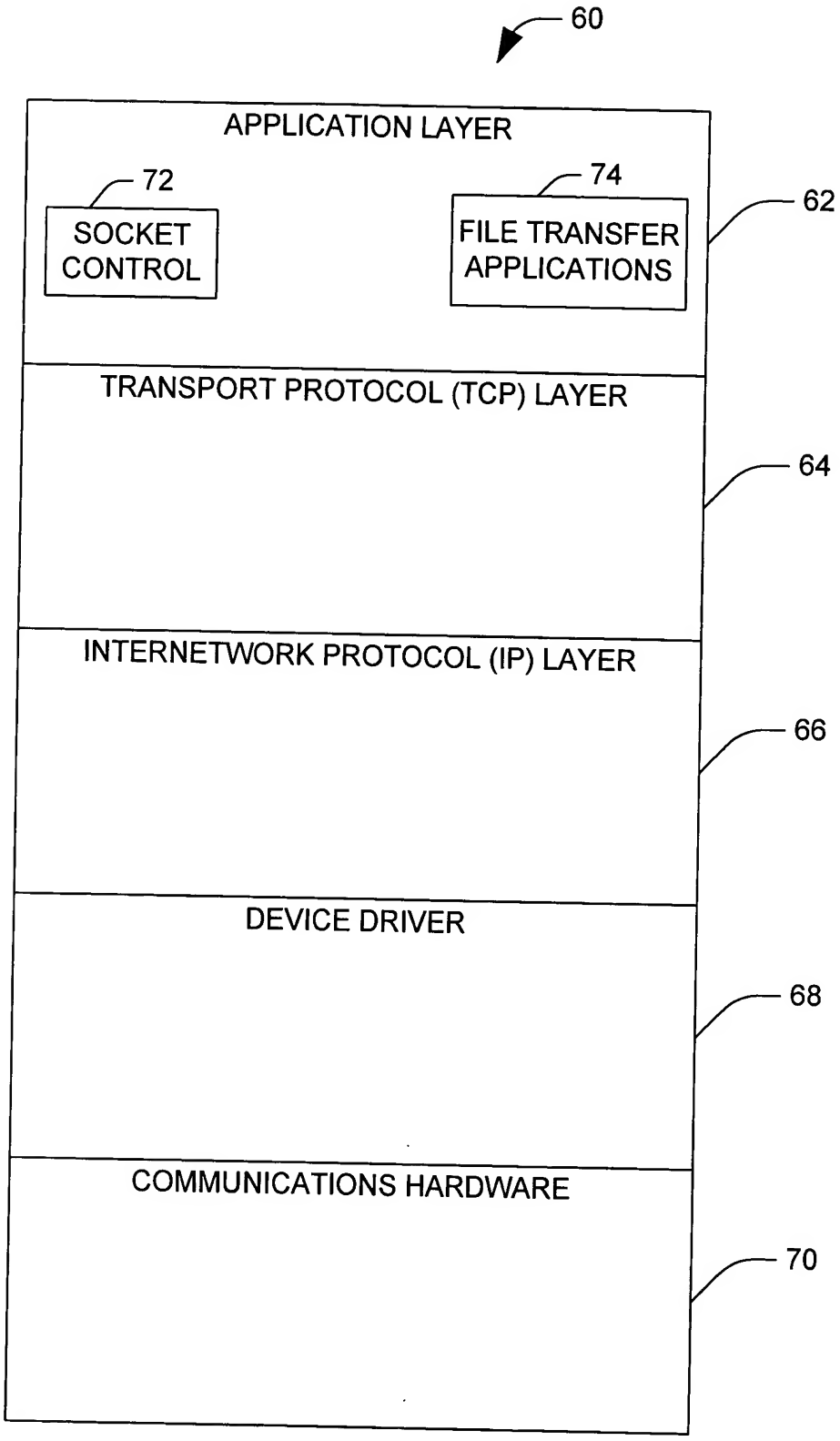
60
APPLICATION LAYER
72
SOCKET CONTROL
74
FILE TRANSFER APPLICATIONS
62
TRANSPORT PROTOCOL (TCP) LAYER
64
INTERNETWORK PROTOCOL (IP) LAYER
66
DEVICE DRIVER
68
COMMUNICATIONS HARDWARE
70

FIG. 3

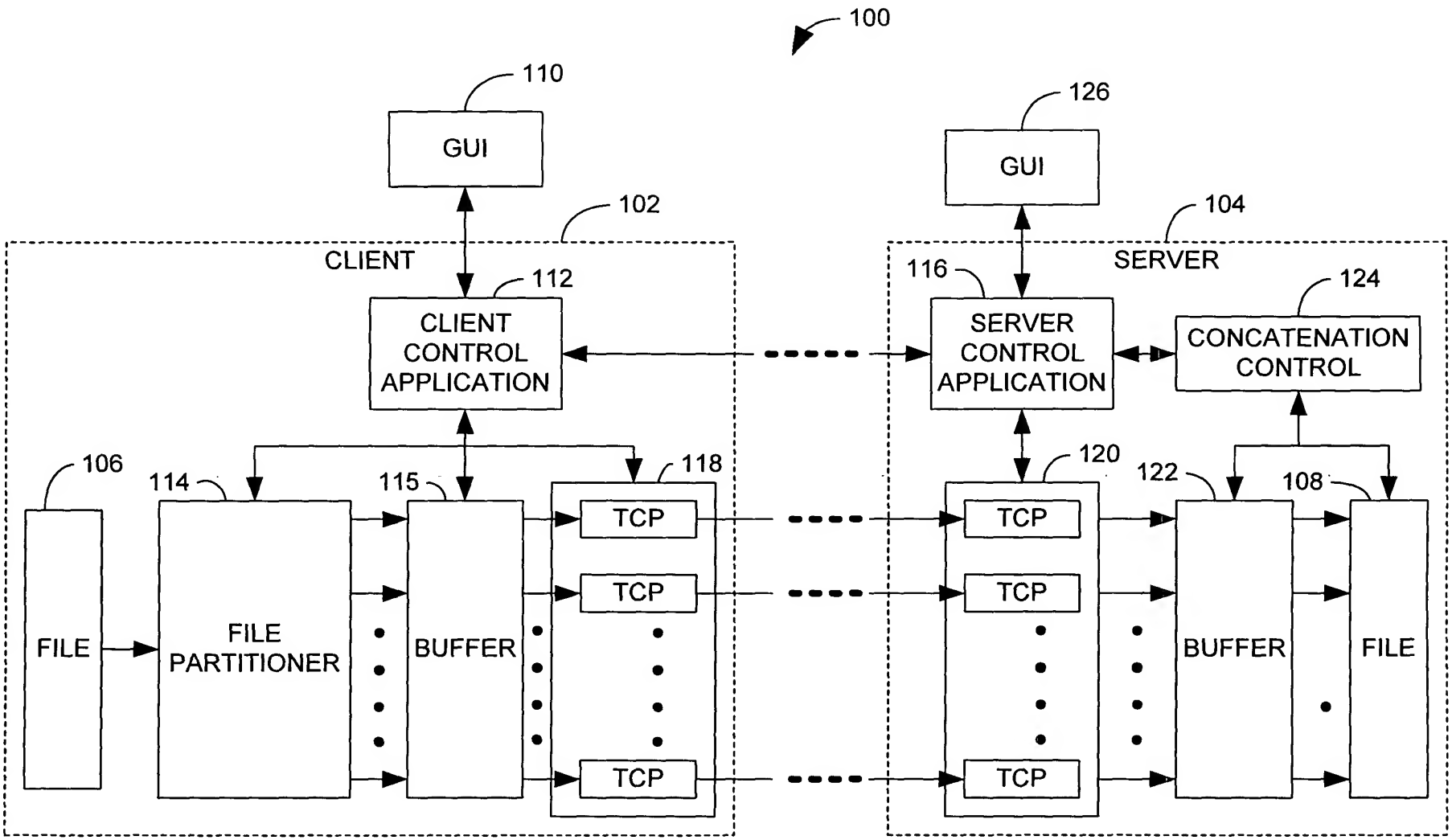
100
110
GUI
126
GUI
102
CLIENT
104
SERVER
112
CLIENT CONTROL APPLICATION
116
SERVER CONTROL APPLICATION
124
CONCATENATION CONTROL
106
114
115
118
120
122
108
FILE
FILE PARTITIONER
BUFFER
TCP
TCP
TCP
TCP
TCP
TCP
BUFFER
FILE

FIG. 4

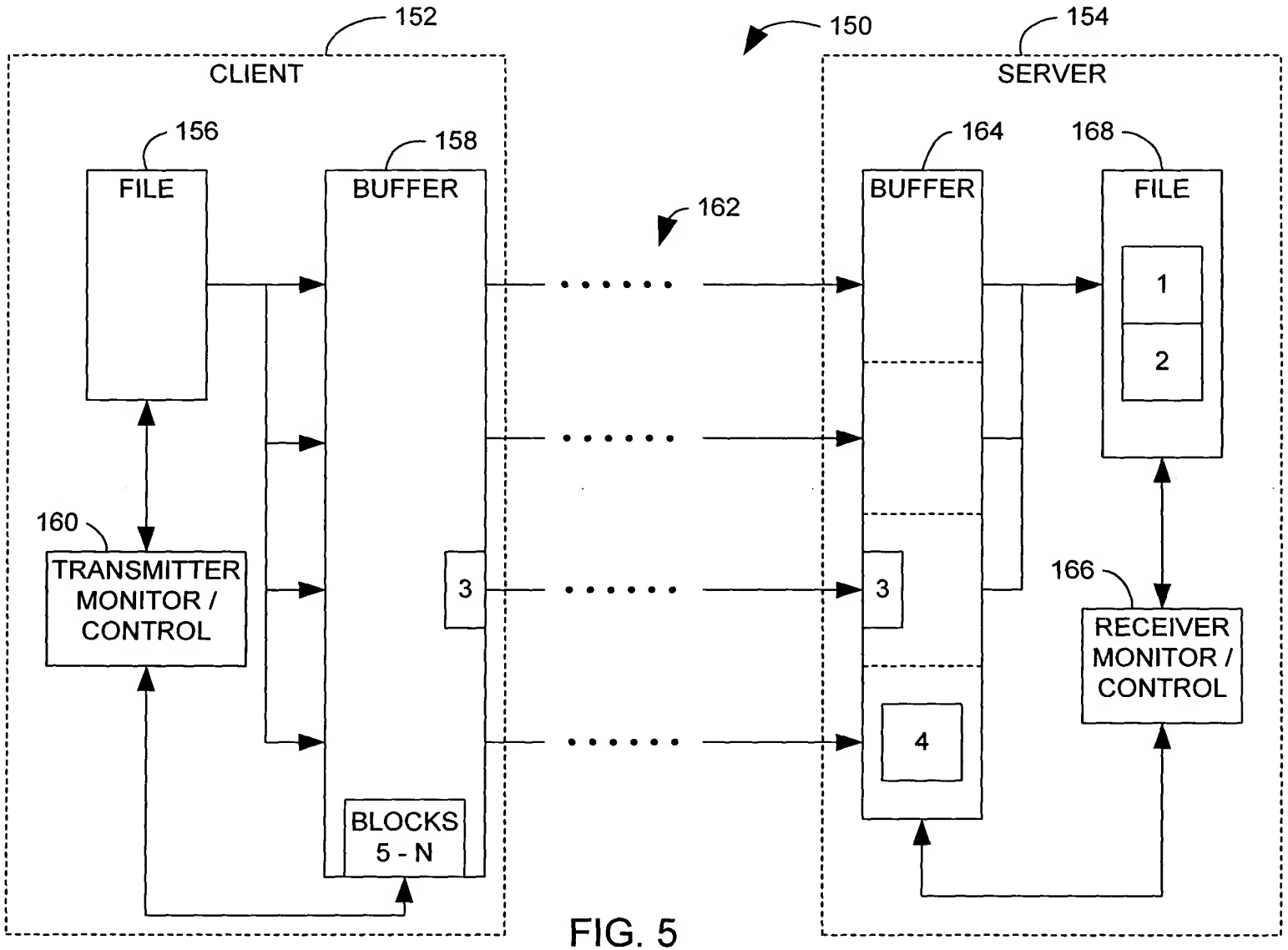
152
CLIENT
150
154
SERVER
156
FILE
158
BUFFER
162
164
BUFFER
168
FILE
1
2
160
TRANSMITTER
MONITOR /
CONTROL
3
3
166
RECEIVER
MONITOR /
CONTROL
4
BLOCKS
5 - N

FIG. 5

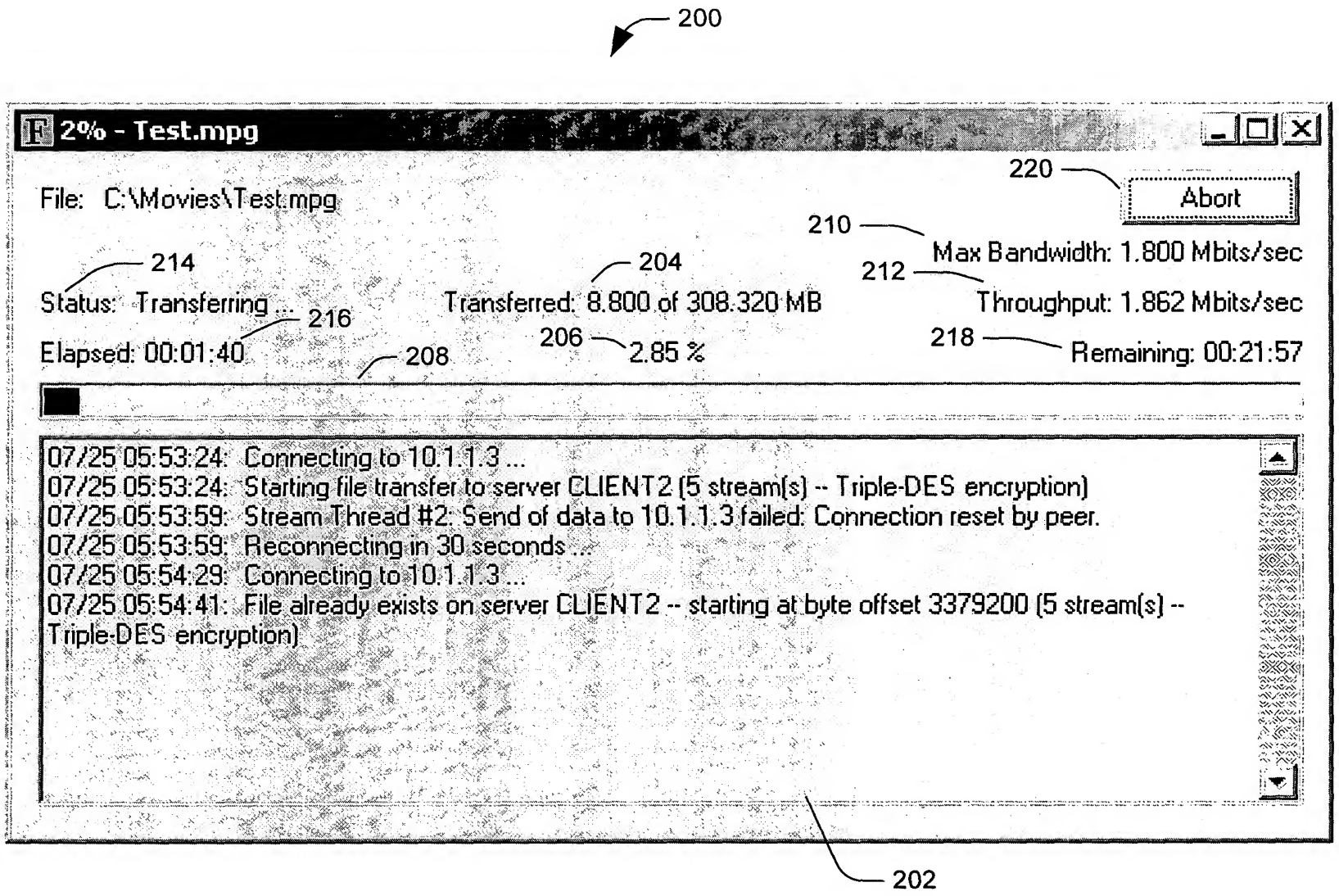
200
2% - Test.mpg
File: C:\Movies\Test.mpg
220
Abort
210
Max Bandwidth: 1.800 Mbits/sec
214
204
212
Status: Transferring ...
Transferred: 8.800 of 308.320 MB
Throughput: 1.862 Mbits/sec
216
206
218
Elapsed: 00:01:40
2.85 %
Remaining: 00:21:57
208
07/25 05:53:24: Connecting to 10.1.1.3 ...
07/25 05:53:24: Starting file transfer to server CLIENT2 (5 stream(s) -- Triple-DES encryption)
07/25 05:53:59: Stream Thread #2: Send of data to 10.1.1.3 failed: Connection reset by peer.
07/25 05:53:59: Reconnecting in 30 seconds ...
07/25 05:54:29: Connecting to 10.1.1.3 ...
07/25 05:54:41: File already exists on server CLIENT2 -- starting at byte offset 3379200 (5 stream(s) -- Triple-DES encryption)
202

FIG. 6

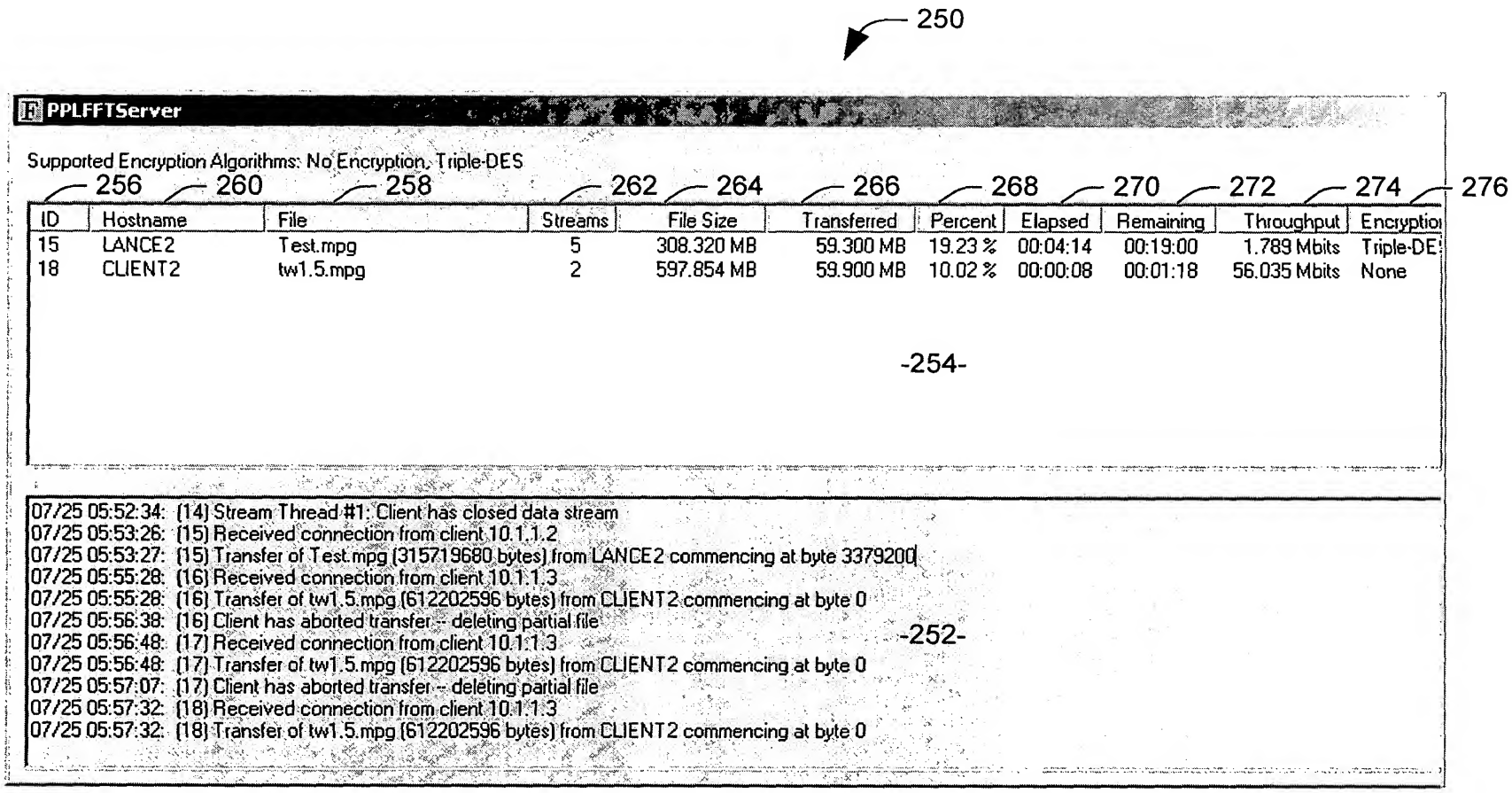
250
PPLFFTServer
Supported Encryption Algorithms: No Encryption, Triple-DES
256
260
258
262
264
266
268
270
272
274
276
ID
Hostname
File
Streams
File Size
Transferred
Percent
Elapsed
Remaining
Throughput
Encryptio
15
LANCE2
Test.mpg
5
308.320 MB
59.300 MB
19.23 %
00:04:14
00:19:00
1.789 Mbits
Triple-DE
18
CLIENT2
tw1.5.mpg
2
597.854 MB
59.900 MB
10.02 %
00:00:08
00:01:18
56.035 Mbits
None
-254-
07/25 05:52:34: (14) Stream Thread #1: Client has closed data stream
07/25 05:53:26: (15) Received connection from client 10.1.1.2
07/25 05:53:27: (15) Transfer of Test.mpg (315719680 bytes) from LANCE2 commencing at byte 3379200
07/25 05:55:28: (16) Received connection from client 10.1.1.3
07/25 05:55:28: (16) Transfer of tw1.5.mpg (612202596 bytes) from CLIENT2 commencing at byte 0
07/25 05:56:38: (16) Client has aborted transfer -- deleting partial file
07/25 05:56:48: (17) Received connection from client 10.1.1.3
-252-
07/25 05:56:48: (17) Transfer of tw1.5.mpg (612202596 bytes) from CLIENT2 commencing at byte 0
07/25 05:57:07: (17) Client has aborted transfer -- deleting partial file
07/25 05:57:32: (18) Received connection from client 10.1.1.3
07/25 05:57:32: (18) Transfer of tw1.5.mpg (612202596 bytes) from CLIENT2 commencing at byte 0

FIG. 7

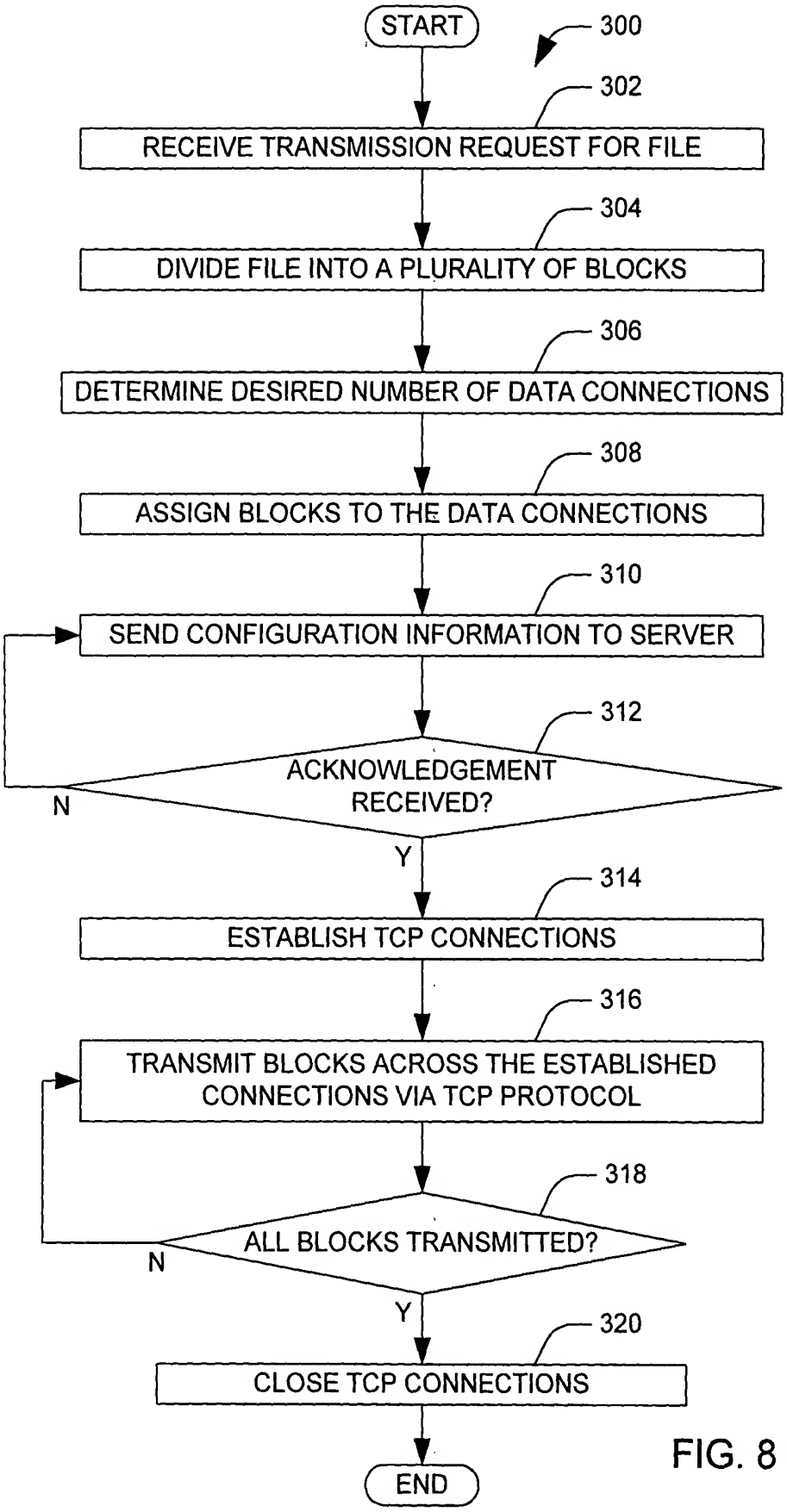
START
300
302
RECEIVE TRANSMISSION REQUEST FOR FILE
304
DIVIDE FILE INTO A PLURALITY OF BLOCKS
306
DETERMINE DESIRED NUMBER OF DATA CONNECTIONS
308
ASSIGN BLOCKS TO THE DATA CONNECTIONS
310
SEND CONFIGURATION INFORMATION TO SERVER
312
ACKNOWLEDGEMENT RECEIVED?
N
Y
314
ESTABLISH TCP CONNECTIONS
316
TRANSMIT BLOCKS ACROSS THE ESTABLISHED CONNECTIONS VIA TCP PROTOCOL
318
ALL BLOCKS TRANSMITTED?
N
Y
320
CLOSE TCP CONNECTIONS
END

FIG. 8

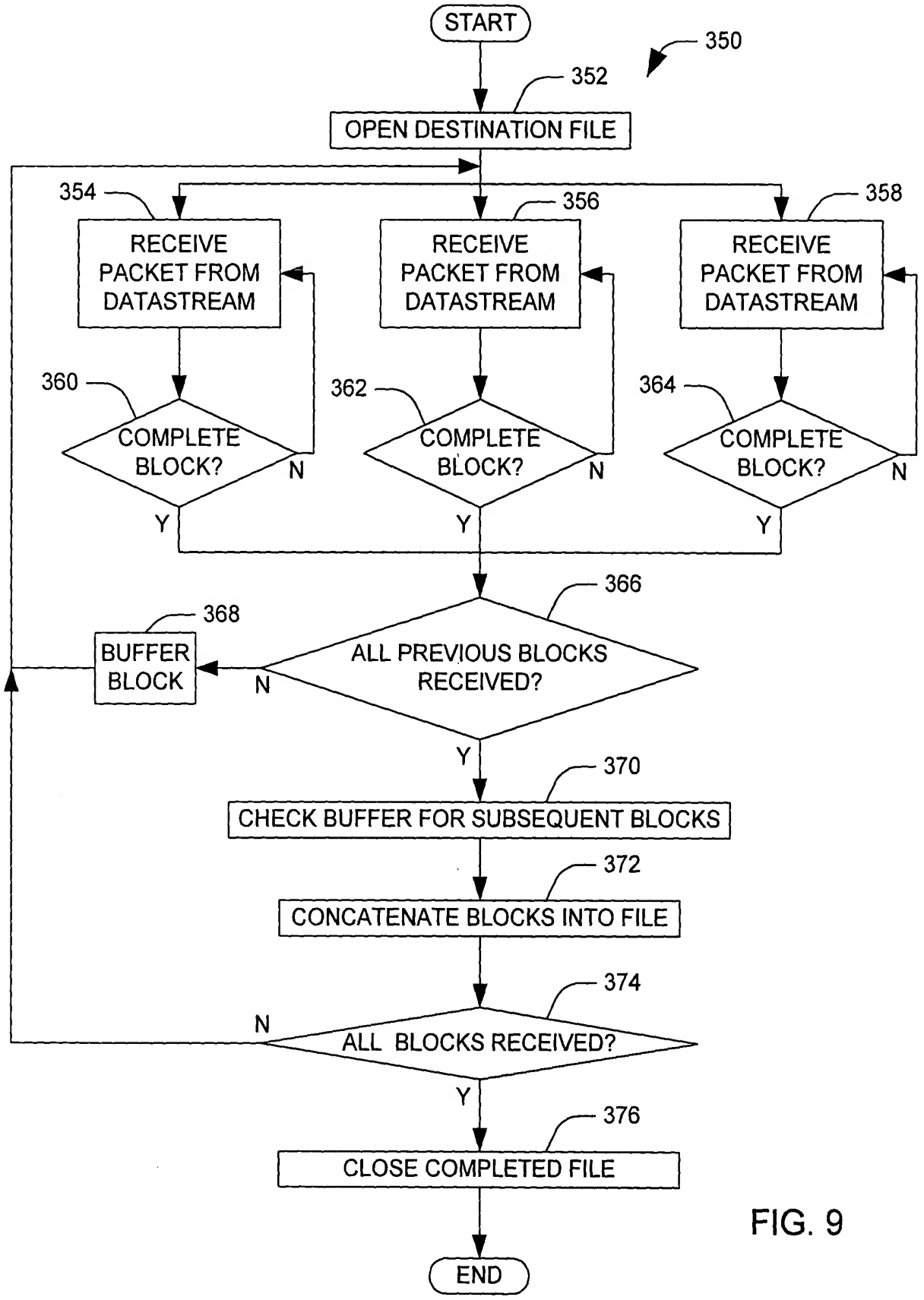
START
350
352
OPEN DESTINATION FILE
354
356
358
RECEIVE PACKET FROM DATASTREAM
RECEIVE PACKET FROM DATASTREAM
RECEIVE PACKET FROM DATASTREAM
360
362
364
COMPLETE BLOCK?
COMPLETE BLOCK?
COMPLETE BLOCK?
N
N
N
Y
Y
Y
366
368
BUFFER BLOCK
ALL PREVIOUS BLOCKS RECEIVED?
N
Y
370
CHECK BUFFER FOR SUBSEQUENT BLOCKS
372
CONCATENATE BLOCKS INTO FILE
374
N
ALL BLOCKS RECEIVED?
Y
376
CLOSE COMPLETED FILE
END

FIG. 9